

CATCHING SUPERNOVAE IN THE ACT

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The progenitors of type Ia supernovae remain a mystery despite their importance as fundamental distance indicators for cosmology. We still do not know if thermonuclear events come from single degenerate binary stars or binaries made from two white dwarfs. Recent models show that the secondary star in a single degenerate binary will cause bright shock emission in the first hours to days after the explosion while double degenerate explosions are expected to brighten monotonically. We propose to monitor about 100 galaxies at $z < 0.05$ in the Kepler field to obtain very early observations of a couple of supernovae. No other experiment --past, present, or presently planned-- can match the time resolution and continuous monitoring of the Kepler mission. This program is also sensitive to shock breakouts in core collapse supernovae which constrain the physics of the early explosion.